

THE CONQUEST OF CANCER

TO-DAY AND TO-MORROW

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this Series will be found
at the end of this volume*

THE CONQUEST OF CANCER

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“*Malum immedicabile cānc̄er.*” (OVID, Met. x, 127)

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THE CONQUEST OF CANCER

INTRODUCTION

The phrase "Conquest of Cancer", though perhaps emotive rather than scientific, nevertheless implies the existence of a very real and important problem. And this problem, it may be confidently affirmed, is one that will never be solved, in action, by the efforts of the medical profession *alone*. Whatever be the future, and as yet reserved, revelations of Science, and whatever the further developments of Art, cancer will not cease to exact its toll unless medical science and art obtain the intelligent co-operation of an instructed public. It is for this reason that it has been thought useful to place before the public this little book, written by a practical surgeon who has given special attention to the problems of the

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laboratory. The book itself, which not only states in simple language the essential points that should be comprehended by the public, but puts forward a plan for concerted action, is based upon one of a series of University Extension lectures given during the winter of 1922-23, at the Shantung Christian University, Tsinan, China, where Mr Wright is actively engaged in the Surgical Department of the School of Medicine.

* * *

The task of prefacing this essay by some words of introduction has devolved upon the present writer, not because he either has, or desires to present, any claim to speak with special authority concerning Cancer, but by reason of a close personal and professional friendship that has led him to appreciate very warmly the knowledge, the sincerity, and the disinterestedness that characterize Mr Wright's thought and work. And he is confident that we may accept what has been said about Cancer at

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Shantung as an honest and candid attempt to instruct and to construct, in detachment from the prattles and prabbles that have sometimes confused discussion nearer home.

Now, although the public has the undoubted right to demand information on this subject, and although, as has been suggested, without admission of the public to the arena of discussion little can be done to diminish the present mortality from Cancer, yet is there real difficulty in communicating knowledge, without engendering unnecessary fear and alarm and sending the hypochondriac to those quacks and charlatans who diagnose non-existent disease in order that they may reap reward by announcing its cure.

Some weaker minds there will always be : so, whenever attention is directed towards some public danger, there are those who adopt the possible contingency as a peg on which to hang some ragged vestment of distracted emotion or thought. Thirty years ago, the

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insane feared the telephone: during the Boer War, many thought that the "scouts were after them"; now-a-days lunatics babble of persecution by wireless, by Bolsheviks, or even by psychoanalysts. So, in Victorian times, the *malades imaginaires* who then thronged consulting rooms spoke with bated breath of Bright's disease: to-day, the hysterical secretly hope to hear the blessed word "Colitis", and the hypochondriac as secretly dread the verdict of "Cancer"!

The task of the medical profession is to enlighten the laymen, that their help may be enlisted, and yet to avoid alike exaggeration and smooth sayings, false hopes and false fears. Macaulay, in a familiar passage, once said that there is nothing more ridiculous than the British public in one of its periodical fits of morality. At present, the British Public is less concerned than formerly with questions of morality, but is very much concerned with questions of health. Perhaps it is not

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so much health that is sought and desired as absence of pain and avoidance of death—which is not quite the same thing. But, though there is nothing intrinsically ridiculous in seeking the “advancement of morality” or the “conquest of disease”, the one, no less than the other, may be pursued in a ridiculous and dangerous manner.

The adoption of ill-conceived measures, designed to improve morals or to abolish disease, may, and often does entail consequences that are even less desirable than the evils it is hoped to combat. While the prohibition of the consumption or sale of alcoholic drinks may diminish certain ills, it has yet to be shewn that the casting out of devils in the name of Beelzebub may not be followed by possession with others yet more violent. A few years ago we were adjured to boil all milk, lest we became poisoned by certain microbes: we are now told that, if all milk be boiled, we are as if deprived of vitamins, and must suffer accordingly.

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Instances might be multiplied ; but it should be obvious that moral and physical health must be considered, not as physical objects, but as relations, or states of equilibrium. Like all states of adjustment or equilibrium, they are the result of accommodation : of poise and counterpoise. They are not always and everywhere to be secured by the throwing of a certain weight into one or other scalepan, or by the cutting-off so many inches from the table-leg that seems the longest. So much, at least, should be recognised by a seriously disturbed public told by the daily press that so many more people than formerly now die of cancer ; that science has not yet discovered the " cause of cancer " ; but that all may be well if only we live on Nebuchadnezzar food washed down by paraffin.

Mr Wright's essay, combining as it does a well-balanced and sufficient statement of what is known, with the outline of a constructive proposition that merits careful consideration, and at

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least indicates to the public the kind of way in which relative safety may be obtained under present conditions, seems one that is eminently suitable for what may be called general reading. The problem is fairly and lucidly presented : the resources of surgery are quietly and reasonably demonstrated : and the advantages are shown of exhibiting that kind of prudence which leads the business man to seek auditing of his accounts and the sportsman to enquire how his score stands. But some words may perhaps be added from the standpoint of one who is a physician, and no surgeon.

* * *

Cancer is a class name given to certain kinds of growths, otherwise spoken of as tumours (or swellings) and ulcers, which are, as we say, characterised by malignancy. A growth, tumour, or ulcer which is *not* malignant is *not* called a cancer. By malignancy we mean a tendency to spread, by local and direct extension (as spreads a

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fire), or by convection, as when sparks fly from a locomotive to a haystack. Malignant tumours or ulcers tend to recur when removed, and, in the long run, to destroy life.

These general features are associated with certain microscopical characters found in the tumours or ulcers, so that the nature of any growth—whether malignant or otherwise—can be sometimes determined by the surgeon or physician, and sometimes by the pathologist or microscopist alone, but, as a rule, is most certainly settled by the physician or surgeon acting in conjunction with the microscopist. Yet, and this is important, not every cancer does actually destroy life. Surgeons of the greatest experience, such as the late Sir Alfred Pearce-Gould, have affirmed that undoubted cancers do occasionally undergo spontaneous cure, or at least arrest of growth, *even in the absence of any treatment*. Again, if excision is practised early, and sufficiently extensively, recurrence does

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not happen, in a certain proportion of cases. Finally, pain is no necessary or inevitable concomitant of cancer. In many cases pain is absent, or almost so ; death may be due to mechanical consequences entailed by the growth rather than to destruction of any vital or sensitive part.

Now, medical men are in the habit of splitting up the group or class of malignant growths (or " cancers ") into two subsidiary groups or classes. One of these is named Sarcoma ; the other Carcinoma. Sarcoma is the name given to a group of malignant growths taking origin in the structures and tissues developed from the " middle layer " of the embryo : the growths themselves—sarcomata—partake the nature of the tissues formed from this middle layer. The other group, of carcinomata, consists of growths taking origin in, and partaking the nature of one or other of the two remaining embryonic layers and the structures developed from them.

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These two layers form respectively :

- (1) The skin and related structures,
and
- (2) The lining of the tube passing
through the body ; its back-
waters, out-growths and
appendages.

It is these two layers which, as Mr Wright so aptly remarks, are in direct contact with the outer world. Now, while the carcinomata (which constitute the class of cancers chiefly discussed in this book) in general affect people who have passed the midpoint of life—those for whom, as Rabelais says, it is *midi passé*—the sarcomata, which are less common than the carcinomata, are rather more frequently, yet not exclusively, found in young people ; in those indeed, who have not reached life's apogee. It is important that these facts should be borne in mind, for generalisations founded upon the study of carcinomata alone cannot be necessarily true in respect of all Cancer, unless the use of the term cancer be

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restricted to the class technically known as carcinoma. To say that Cancer can be prevented if constipation is avoided is clearly misleading, when we remember that quite young children, nay, infants, may be the subject of sarcoma ; unless of course we define cancer, as some would do, as the kind of growth that, *ex hypothesi*, is prevented when constipation is avoided. It is confusion of this sort, bred by slovenly expression out of loose thinking, that is in great part responsible for the present bewilderment of the public.

Another fertile source of confusion is the obscurity that attends both the popular and the professional use of the words " cause ", " causation ", and the like. The public demands that " the " cause of cancer be discovered, and is prepared to pay generously that this discovery be made. Unfortunately neither the public, nor men of science, care overmuch to discuss what they mean by cause and causation. This is no place in which to trench upon a

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province unsuccessfully explored by Locke, by Hume, and by Kant. Yet it is of vital importance that all doctors, scientists, and laymen should recognise two different *uses* of these words.

When we speak about "the" cause of a "disease", in a generalised or conceptual sense, as when we say that Koch's bacillus is "the cause of tuberculosis", we are really defining our concept of the disease in terms of *one* correlative. We are saying that tuberculosis is a disease in which Koch's bacillus is invariably present. A *circulus in definiendo* is only just escaped because we happen to know that, if Koch's bacillus is injected into certain animals, the "disease" as we say, develops. Koch's bacillus is the one constant correlative found in all cases of the kind that we agree to call tuberculous, by reason of certain clinical and pathological signs that we find. Possibly even this statement is not to be taken as absolutely true ; though it represents what we find it convenient to say. But,

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when we thus declare Koch's bacillus to be "the" cause of tuberculosis, we have by no means exhausted the study of all the correlations that may be called causal in respect of *particular* cases. Of ten cases of tuberculosis, each one exhibiting Koch's bacillus, we may say that *for each particular case* "the" cause of the illness is different.

Thus :

- A. is tuberculous because he was gassed in France ;
- B. is tuberculous because he was infected by his sick wife ;
- C. is tuberculous because he drank tuberculous milk ;
- D. is tuberculous because he worked in an ill-ventilated factory ;
- E. because he was exposed to wet and cold ; and
- F. because he drank and was dirty.

The difference between a medical cause in the generalised sense, (where cause means a defining correlative for a concept), and a medical cause in the

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particular sense (when we seek to find out or state the antecedent without which this man would not be as he is here and now) is one of enormous importance, and one that should be constantly borne in mind when discussion is commenced. It is true that it involves the oldest of logical and metaphysical problems in respect of scientific thought—the question of universals and particulars; but that does not make it any the more easily shirked. Its relevance to the question of cancer is this: that the proof of the production of cancer in men or in animals *under one set of circumstances* does not warrant us in saying that that set of circumstances *as known to us* involves *all* the factors without which cancer cannot occur. And, even if research work demonstrated that, in every case now called cancer, some parasite or growth-form, some irritating factor that can be isolated, does actually obtain, *unless it could be shewn that this parasite or factor is never found except*

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where there is cancer as we now define it, we should have to proceed to investigate why and how cancer does not always occur when this factor is present. Just so are we at present seeking to explain why and how, of so many persons exposed to infection by Koch's bacillus, only certain ones do become diseased. If we find that only those persons who possess a character that we may call "X" become infected, we shall then have to say that, not Koch's bacillus, but the character "X" is "the" cause of tuberculosis. It is thus that science progresses: not by making the absolute and positive discoveries that the public is taught to expect, but by arranging and re-arranging our experiential knowledge, as such grows, in terms of so-called laws and generalisations, that are found progressively convenient. But such laws and generalisations are not necessarily the one more "true" than the other, except in relation to the knowledge that they summarize. If such considerations

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as these were more frequently borne in mind, there would be less unconscious deception, less disappointment, and greater economy in work and thought.

Explanations of the causation of cancer have been sought in many directions; and three chief theories have been set out. The most important, and the most interesting from the point of view of the practising physician, is that which considers cancer as provoked by long continued irritation under certain circumstances. This doctrine seems more "true" in respect of the Carcinomata—the cancers of the adult and the old, and of tissues in contact with the extra-personal world—than it is in respect of the Sarcomata—the cancers of the young, and of those inner parts not exposed to irritation by contact with the world. Yet sarcomata in real life do often seem to follow *injury*, and the tissues in which they form *may* be obnoxious to injurious influences of which we know nothing.

Another view is that cancer may be

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due to a parasite of some kind or another. Certainly, so far as some lower animals are concerned, this is true, for certain rat and mice cancers are now known definitely to be associated with parasites. But then we may say, and properly, that in such cases the parasites are merely acting as do other irritants, and are not "specific" causes of cancer.

The third doctrine, or set of doctrines, regards cancers as arising when parts of the body (or rather, elements in the tissues of certain parts) no longer act in due subordination to the needs of the whole organism, but comport themselves "anti-socially": developing irregularly; propagating themselves illegitimately; and so becoming parasitic to the commonwealth of the body. Those who hold this will admit that, in many cases, this revolutionary tendency is one provoked by irritation and the like: that sometimes it is a mere manifestation of irregular decay; and that, when it occurs in young

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subjects, it is because some islets of tissue have become misplaced, tucked away, ill-formed, and hampered in development, and so liable to provoke trouble later under stress of greater or less urgency. Such a view has much plausibility ; there are flaws in a steel girder ; there are tucked-in edges in even the best bound book, and there are developmental errors in most of us.

Moreover, there is Dr Creighton's doctrine of physiological resistance. A part not put to its proper use is more apt than another to become cancerous. Certainly, unmarried women are more liable than are married to suffer cancer of the breast or ovary. Yet married women are more apt than unmarried to suffer cancer of the womb. Are we to say that in these latter there has been physiological misuse, or irritation produced by unhealthy child-bearing ? So far is the problem removed from simplicity !

On the other hand, it is certainly as true as ever, that the gods still cancel

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a sense misused, and, if we leave out of account for the moment the cases in which cancer seems due to developmental error—and who can say whether even then a child does not suffer vicariously for some physiological transgression by its parents?—the doctrine that cancer is due to irritation, whether produced by a clay pipe, hot drinks, constipation, or crude paraffin, does not really tell us much more than *that*. The difficulty is this: *How* to walk in the way of physiological righteousness, and *how* to preach it, without falling into a dogmatism as stupid as unbelief? Mr Wright tells us how, in medieval times, the Church declared* cancer of the tongue to be sometimes a judgment on sinners for their blasphemy. Well, I for one, am not prepared to limit the “misuse” that entails physical disease and suffering to misuse in the material, or physiological sense. Organs, through the nerves of the “sympathetic”, are directly connected with the play of

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emotions and of feeling-states. I am not sure that investigation would not shew a correlation — sometimes — between certain persistent and voluntary mental states (*morbid* mental states, that is) and the development of cancer in certain organs. The “argument” that cancer is infrequent in lunatic asylums, where the majority are mindless rather than wrongly thoughtful, evades the question.

The quest for a single causal factor, whose “discovery” will lead us to “abolish cancer”, is then, it would seem, just one more hunt for the philosopher’s stone. Yet, to use the formula of “right living” does not seem to be merely a verbal solution of the difficulty.

If we agree that to live rightly is the best insurance we can make against cancer, we are probably stating, as compendiously as possible, *all* we do and shall ever know, in respect of the causation of cancer. It is then our duty to ascertain how to live rightly

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in every sense of the word, and we may so come to realise that almost every one of what we call the blessings of civilisation has been purchased at the expense, in some respect, of right living. For this, heavy interest has to be paid, and even the efforts of science to put matters right seem too often not more than the borrowing of fresh capital to pay off old debts. It is right to call attention to the fact that certain "uncivilised" races, who live healthily and naturally in respect of food, drink, and sexual activity, do not suffer from cancer. But it is wrong to suggest that therefore we should adopt either their dietetic or their sexual customs. * What is one man's meat is another man's poison. Adjustment to our surroundings, right living *here and now* is what we need. Though Papuans and Sikhs may be very properly adjusted in *their* contexts, it is not their adjustments that may best suit our cases.

This problem—that of right living—is the problem of prevention of cancer

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put upon the broadest basis. But, until or unless we work this out, we have to consider how best to avail ourselves of the knowledge already in our possession. Herein is one merit of Mr Wright's plan. He tells people what, in his judgment, they can best do, *here and now*. It is a plan to be discussed ; but, let it be clearly understood, it is one submitted by the author for individual consideration and action. Supposing it to be found, on analysis and trial, of real value, a cry might at once be raised for its putting into execution by central or local provision of the necessary facilities : at first for voluntary acceptance, then for compulsory adoption. Nothing could be a greater error. In matters of health what is advantageous for the individual is often not so, or even grossly disadvantageous, for the State.

Let every member of the State have the opportunity to avail himself or herself of what Science and Art can do for him : let none who has the will

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suffer because he has not the means. But the too easy provision of means for the avoidance of consequences of neglect does, very seriously, put a premium on neglect and penalise those who themselves make effort in the right direction. Again: hard on individuals though it would seem, there is a very real racial advantage in the elimination—natural and inevitable, unless we interfere—of those who *will not* take advantage of opportunities offered them. We are not automata: we exercise *choice*; when the opportunity of choosing rightly is offered us, if then we choose wrongly, we have no right to demand escape from the consequences, *at the expense of others*.

At any rate, if the facts relating to Cancer are plainly stated, every man has but himself to blame if he shrink from obtaining such diagnosis and treatment, as is now available, at the earliest moment. It were better still that he avoid from the beginning all what we know to be predisposing

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causes of cancer : all the errors of omission and commission in respect of the physiological and spiritual—or physical and psychical—functions and relations of his Self.

It is the principle, the pursuit of the unattainable ideal, that really counts. The simple injunction to eat greens and take paraffin is the physiological counterpart of seeking to make people moral by act of Parliament, religious by church-going, and intelligent by attendance at evening lectures. But even if we make all possible effort, we cannot *all* hope to escape, and the necessity for seeking early diagnosis when things go not well is as imperative as is true the maxim that “ A stitch in time saves nine ”.

There is perhaps one more question that may be touched upon : that of the so-called *increase* of cancer. It is commonly stated that cancer is increasing : it is as commonly asked if this is really so. As a matter of fact, the question (which we are usually

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told can be only answered by statisticians) is one that statisticians can only answer when we have agreed what they are to understand by it. And that is not so easy as may be at first thought.

It is certainly true that, in the British Isles, the number of deaths certified each year as due to cancer of one form or another is gradually and steadily increasing, both absolutely and relatively to the population. But then we have in the first place, to consider whether cancer is not diagnosed more frequently in ratio to the cases seen than was formerly the case, and, in the second, to remember that cancer is, on the whole, a disease suffered during the second half of life. Now, our population is an older one than it was: the birth-rate is falling: so many youths who would now be vigorous men of thirty-five to forty lost their lives in the war; and lives are, on the whole, longer than they were, owing to a diminishing liability to suffer from certain ailments other than Cancer.

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Supposing that children ceased to be born, at the same time that the Ministry of Health succeeded in "abolishing" all diseases except cancer, and the Home Office and Police reduced the probability of death from accident, from homicide, and from suicide, to vanishing point. Would we not then all die from either "old age" or from "cancer"? If so; should we be justified in declaring that cancer had "enormously increased" since the successful institution of control of our own deaths and other peoples' births?

We are, indeed, again confronted with the old problem of the one and the many, under one of its numberless aspects. From the point of view of the statistical bureaucrat, cancer is increasing. That is to say, an increasing number of deaths, and an increasing proportion of deaths, are every year presented to him, both absolutely and in relation to the population. And so many more perforated cards are in

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consequence manipulated by his counting machine.

Can it be said that, for any one reader of these pages, the chances of death from cancer are year by year increasing, as are the chances of being run over in the London streets? Who can say?

But this is true. We must all die. We are, for the most part, anxious to postpone the day of death, and many of us dread, more than aught else, a death from cancer.

Effort in the path of right living—if steadily pursued—and the intelligent utilization of what Science and Art and Experience have to teach, will undoubtedly make for healthier and longer lived communities, and will lessen, *for each individual*, the probability of dying otherwise than in the fashion thought of by the doctor when he ascribes death to “old age”. The problem we are considering becomes indeed swallowed up by a still greater one; but, those who profit by what

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Mr Wright has had to say about Cancer, will profit in respect of this greater problem as well. Therein, so it seems, lies its greatest value.

F. G. CROOKSHANK

London, 1925

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The cure of cancer is now ceasing to become a purely medical problem, to be solved by biologists, pathologists and surgeons, and is becoming a problem in psychology, and education, to be solved by publicists, schoolmasters, and perhaps, when enough people are alive to the facts of the situation, by legislators and statesmen.

This may sound a bold thing to say, but I hope to be able to bring forward evidence proving that it is at present possible to cure seventy-five per cent. of cancer cases with a mortality of under five per cent.

Possibly the response to this essay will be that of one of the most enlightened persons of my acquaintance who, on seeing my title, said, "Of course this is perfectly absurd", but it was a favourite saying of Dr Maguire,

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a great American surgeon of the nineteenth century, that the „most useful thing one man can do for his fellows is to see a thing clearly, and to say it plainly.

Here is a plain statement, susceptible of the fullest proof. Out of every hundred people in our community, ten will in all probability die of cancer ; and, of those ten, seven or eight could be cured, or their disease prevented with the present methods at our disposal. All that is required is an intelligent facing of the facts concerning this disease, and efficient medical attention.

The average annual deaths during the last eleven years in the United Kingdom were 466,000,—nearly half a million people. Of these, 43,000 were due to cancer ; 19,000 males and 24,000 females. Moreover, although taken altogether ten per cent. of the of the population die of cancer, a greater proportion of adults so die. I say again that a large proportion of

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these cases is either preventable or curable.

The Executive Committee of the British Empire Cancer Campaign have recently published a statement based on the last census. They say that, during the year 1921, in Great Britain, of persons over 30 years of age, one out of every seven died of cancer.

These figures make it plain that the question is not merely one of interest to doctors and scientists; it is of concern to every one of us, and to one person in every ten it has direct and very personal interest.

Surgery and medicine have very little further to advance along technical lines, so far as the type of case we see at present is concerned. It is nearly impossible to make operations more extensive and thorough than they are at present; and it is unlikely that the operative mortality in the average good risk will fall much lower than its present very small figure. Other methods of curing cancer do not at the

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moment show promise of producing anything so good as the present surgical results. We have therefore to resort to an educational campaign for its victims before we can get much further on.

This brings me to the first point to be brought home before any more is said—that *early* cancer and *late* cancer are, so far as results and cures are concerned, two entirely different diseases. A well-known English authority, speaking of cancer of the tongue, says: “An early superficial cancer on the free part of the tongue should be, and is, curable in practically all cases. The general conviction of the incurability of cancer is founded on the results of operation on the average fairly advanced case and, until this conviction is shaken, I fear the public will remain relatively indifferent and pessimistic as to the advantages of early treatment. Every surgeon of any experience is aware that, as regards its accessibility to treatment, early cancer is a totally different disease from even

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moderately advanced cancer, but I am very doubtful as to whether we shall be able to enforce the fact by direct statement so long as the treatment of advanced cases furnishes the public with so many terrible object lessons in the apparent intractability of the disease."

The problem we have before us, then, is that of changing the whole attitude, not only of the physician, but of the patient, to cancer. Here is an example of the present point of view:—I have frequently heard it said that such and such a patient has a lump, or some disquieting symptom or other, but she won't go to the doctor as she is afraid he will say it is cancer. What we have to do is to strip this disease of its fear-complex and bring all the facts about it into the open. We have to change the attitude of the patient, and often, unfortunately, of his doctor, from one of "wait and see" to one of "look and see." Then, and only then, shall we be on the way to curing cancer.

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The results of the present-day and popular point of view are, appalling. Somewhere about half the cases of cancer are far too advanced for us to think about curing them at the time the patients appear. Of the remaining half, approximately two-thirds have about a thirty per cent. chance of cure, and the remainder about a sixty per cent. chance. These figures are rough estimates based on impressions formed in hospital out-patient work, but they will not be found far wrong. The heart-breaking part of it is that it is all the result of fear, carelessness and crooked thinking, which could be avoided in a large percentage of the cases.

Yet there are signs that we are entering on a new phase, and that a realisation of the importance of early diagnosis is slowly permeating through the medical profession. In America we see an increasing insistence on the use of detailed and specialised laboratory methods for exact diagnosis ; and in Great Britain there is in existence,

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at St. Andrew's University, a complete medical unit, under the supervision of Sir James Mackenzie, for the investigation of the early symptoms of disease. The establishment of this institute is, I think, one of the most important advances that medicine has made in the last twenty-five years, for it is a milestone on the road to progress, a concrete and tangible expression of a changed point of view.

Let us for the moment leave generalities and give some few minutes to more detailed consideration of the disease ; first in outline, and then in respect of some particular cases.

Cancer is a degeneration. It most often occurs at that period of life when our biological work is done, and, as far as Nature is concerned, we are of no use. From *her* point of view we are on this planet to reproduce our kind and, when we are past doing that, our tissues begin to lose their firm hold on their appointed form, and stray from their former habit of exactly reproducing

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their kind when attempting to recover from any kind of injury. Cancer is commonest in those organs which have soonest finished their work—the reproductive organs of women ; and, after these, it appears most often in that organ so much more abused than any other—the stomach.

The greatest number of cases appears at or after fifty, and therefore at that age it behoves us, not to *wait and see* whether we shall get it or not, but to *look and see* that we have not got it, for of people who survive till the age of fifty, a great many more than ten per cent. die of cancer.

From the biological point of view cancer presents another interesting feature. It used to be generally stated by biologists that acquired characteristics cannot be transmitted. In cancer we see a cell taking on foreign characteristics in response to some environmental stimulus and transmitting these to its offspring until the organism from which it sprang is destroyed

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³ To sum up, the tissues from which cancer grows, in their normal process of repair tend to reproduce themselves more or less exactly, or if the injury is too gross, they are replaced by scar tissue ; but when we reach the age at which their biological work is done, there is a tendency to atypical reproduction, in which an atypical cell continues to reproduce itself atypically and grows at the expense of the organism, eating into or eroding it as it enlarges, till it finally kills the host on which it preys.

This will serve as a general definition, but, if we wish to be a little more concrete, we must plunge for a while into the realms of pathology, in order to get a clearer idea of what cancer means.

Our body is made up of three layers of tissues ; each of these has its separate function, and, within small limits, its own way of reacting to long continued injury. Early in our pre-natal development, these three layers

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can be distinguished, and each of these later produces its own type of tissue, and under appropriate conditions, its own type of malignant tumour. From the outer and inner layers develop the cells which actually touch the outside world, that is to say, which cover the exterior of our body and provide our inner lining, or mucous membranes. From the inner layer is developed glands which are, so to speak, ingrowths from this layer, and it is the tumours arising from this latter tissue layer which mostly concern us now, and which are the cause of so much human suffering.

These Carcinomata, as they are called, all have something in common, alike from the point of view of their recognition, pathology and onset. They begin in some tissue which has previously been the seat of disease, usually some chronic inflammatory process which has been present for years, and which may have healed up and broken down many times. When

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this occurs on open surfaces, such as the tongue, intestinal mucous membrane, or lip, we can watch the gradual transformation of the disease from a simple chronic inflammatory process to that of a malignant growth.

Let us take, for instance, the case of cancer of the lip. We see an old man who for years has been smoking a clay pipe. The stem of the pipe gets shorter as the years go by, and consequently, as he smokes it, hotter and hotter. One day he notices that his lip is cracked, the crack being just on that part with which he habitually holds his pipe. If we were to look at this under the microscope we should just see that the mucous membrane was broken at this point. Perhaps he stops smoking for a day or two till his lip has healed, and then continues to smoke again. Soon, from force of habit, the pipe returns to its old comfortable spot ; and again the lip cracks. This time it is not so painful, and takes longer to heal. This cracked lip may be present for years,

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and if, after some time, we were to look at it again under the microscope, we should see a very different kind of thing. All round the crack would be congregated thousands of white blood cells, trying vainly to assist the sore to heal, but, as well as this, we should notice that, in their efforts to bridge the gap of broken mucous membrane, the delicate epithelial cells which line our lips had increased in number and thickness. We might also see that they had a tendency to grow down to the deeper layers of the lip.

If we were to persuade our friend to give up his clay pipe and indulge in some other form of smoking, or even to have a few teeth extracted so that his pipe was more comfortable in some other position, the small ulcer would, given time and a little attention, heal up quite satisfactorily. But, with all the perversity of human nature, he will not ; he only has a small sore : it doesn't hurt him, or anyone else, so why should he worry ?

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We pass on another few years, and our friend reappears. This time his sore has a more permanent appearance about it. It is hard, and somehow looks as if it goes deep, and has a tendency to bleed. We look at it and tell him that he ought to let us cut out that small sore, but as a rule he won't allow this procedure ; he wants medicine to take for it, an ointment to put on it. If we were again to have a microscopical section at our disposal we should see a very different state of things. Those epithelial cells which before were just thickened, and a little angry looking, have at last wakened up and begun to grow. They have branched out and grown deeper into the lip ; there is nothing to check them since they have thrown aside all the restraints imposed by the necessity of keeping to their original form, and have, so to speak, got out of the control of the usual mechanisms which the body possesses for keeping cells in their proper place. The only thing we can

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do for the patient is either to find some means to kill them—an end which has not yet been achieved, as what will kill them will also kill the patient—or to cut away the tissue in which they have grown, leaving a wide margin around the farthest palpable edge of the ulcer. If this is done, the patient can be assured of a permanent cure. But if he will not believe you, as he often will not, possibly because you are not willing to stake your reputation on the ulcer being malignant, or the *certainty* of its cure by surgery, he will go away for another year or so. One day he appears again because his ulcer has been showing a tendency to bleed and has got a bit bigger lately ; also he has noticed, while shaving, a small hard lump in his neck which he feels as the razor goes over it. He still has no pain and no discomfort whatever. We look at this and tell him that he has to undergo an operation, both on his lip and on his neck, and that he has got cancer. We remove the ulcer and

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every gland that we can find in a large area around; but we can only assure him that he has a one in five or three chance of a permanent cure whereas, if, he had taken our previous advice, we could have promised him a permanent cure in between ninety and one hundred per cent. of chances, according to the age of the disease.

If we now use our microscope, we see that the undisciplined epithelial cells have penetrated the lymphatic capillaries which are present in all our tissues, and have followed them until they reach their destination, the nearest glands. What will happen next depends on time. The growth may spread to more glands, or even outside the glands, and the only course we have open to us is to remove the primary growth, again with a wide margin, irrespective of what disfigurement may result, together with its corresponding lymphatic glands, trusting to radium or X-rays to kill any stray cells that may be set free or missed during the

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operation. The chances of cure simply depend on whether it is possible to remove the disease completely or not.

The figures I have given are taken from a recent analysis of more than five hundred cases of cancer of the lip carefully followed up. Of cases in which there were no glands involved, ninety-one per cent. were cured: of those with glands only eighteen per cent. were cured. Now here is the point I want to emphasize. The average duration of all these cases was two and a half years before operation. It is impossible to devise any more radical operation, with a much lower death-rate than we at present obtain, and there is no other method which as yet produces better results than I have just quoted, but it *is* possible to do away with that two and a half years of waiting and medicine. There is no reason for it but ignorance, neglect, stupidity, self-deception and fear.

The example which I have just quoted is not an unusual one, nor, as

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I hope to show you later on, do the figures materially differ for cancer arising in other parts of the body. Cancer of the lip merely happens to be a convenient, and easily understood, peg upon which to hang my text.

Cancer is practically always preceded by chronic irritation of some kind or other. There may be, and in fact are, other factors which enter into the problem, but there can be no doubt that in nearly all cases there is what may be called a precancerous stage, which, if adequately dealt with, will often prevent cancer appearing at all. It is moreover a longstanding chronic condition which, as a rule, gives rise to very little inconvenience on the part of the patient.

After this *precancerous* stage there appears what may be called *early cancer*, often indistinguishable to the naked eye from the original precancerous lesion, but giving rise to great suspicion in the eyes of the initiated on account of its hardness, and tendency to be

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fixed, and its resistance to treatment. Cancer in this stage can be cured, with results which will compare favourably with the cure of any other known disease (i.e., in about ninety per cent. of all cases) its cure simply depending on early diagnosis. This is a fact neither known nor appreciated by the general public, and until it is known by everybody, and these early stages are radically dealt with, we shall still be spending our time and money looking for new and miraculous cures for a condition which, in its very nature, is unlikely to be susceptible to any method of cure when its late stages are reached.

The third stage is that in which the neighbouring lymph glands are involved. In this stage about thirty per cent. are incurable, but these figures are not of much help or comfort to any particular sufferer as they depend on the degree of involvement and the rapidity of growth. There is, in the vast majority of cases, no reason why it should ever reach this stage other than those

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causes which are within the control of the patient and his doctor.

Lastly we get to a stage in which the disease is frankly inoperable, and generally speaking, only capable of relief by one palliative measure or other. About forty to fifty per cent. of all cases which reach the surgeon have already arrived at this stage, and it is to this fact that the generally hopeless attitude of everybody is to be attributed. It is only when this stage is reached that the patient has pain and symptoms which "wake him up," and that he realises the calamity which has befallen him.

The early signs of cancer may now be summed up as those of a lesion of some kind, extending over a number of years, giving rise to very little trouble or inconvenience, and followed by a small hard lump or ulcer. If the latter is present, it is often characterised by bleeding. Again, practically no symptoms. To find it we must *look and see*; often an operation involving

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practically no suffering and a very small mortality is necessary. But the penalties of failure to do this at the proper time are that ten per cent. of the population die of cancer.

There are certain popular misconceptions about cancer which require correction. The first is that cancer is necessarily painful. This is responsible for much of the late diagnosis, operative mortality and the bad results. Only late cancer, and it would not be far wrong to say only *incurable* cancer, gives rise to pain. If only pain were an early sign of cancer the whole aspect of the cancer problem would be changed.

Another very widespread delusion productive of great harm is that cancer is constantly associated with *wasting*, and makes *rapid progress*. These two symptoms are constantly associated with the disease in its latest stages but are not seen at all in early cases.

One frequently hears people say that cancer is contagious, and also that it is hereditary. These two popular

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conceptions probably have the same basis. As we have seen, cancer is a very common disease, and it would be strange indeed if, putting all question of relationship on one side, we were not to see it quite commonly occurring in one or more members of the same family, and if occasionally we did not find a house in which each successive occupant for some years had cancer. I will leave it to the mathematicians to work out the probability of cancer occurring more than once in any given family. The necessary figures are easily obtained from the Registrar-General's office. As far as I know, there is nothing truly in the nature of what may be called *evidence* in support of either of these notions.

Time after time people have described parasites of some kind as associated with cancer, but none of them has yet been made to answer to any of the tests necessary to establish anything more than a casual correlation. It may turn out to be that the causal agent in cancer

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formation is a parasite either visible under the microscope, or, what is more likely, belonging to the group of ultravisible, or filter-passing, organisms ; but even if this be so, there are two other factors of immense importance, found so constantly associated with the disease, that their significance cannot be underestimated by anyone whose outlook is any wider than that of the mere purveyor of prescriptions.

These two factors may be considered in a little more detail, as they are of importance with regard to the question of prevention. They are (1) the presence of an acid environment, and (2) what, for want of a better term, may be called chronic irritation. Whatever the prime cause may turn out to be, these can never be left out of account in any consideration of aetiology, and even if some specific cause is found, the discovery will not shake the validity of my thesis.

For two thousand years people have speculated about the origin of cancer.

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Galen held a theory somewhat analogous to the present Chinese doctrine of the *yin* and the *yang*; he taught, in essence, that some kind of "ch'i" had got at loggerheads with its fellow gases, and that the result was a general disturbance of bodily functions. Paracelsus thought that the salt balance of the body was upset, and textbooks still sometimes put this into modern medical terminology, saying that the balance of power between different types of cells is disturbed. This may or may not *describe* what happens, but it is a long way from *explaining* it.

In the sixteenth and seventeenth centuries cancer was often referred to as an "act of God" in punishment for sin. For instance, cancer of the tongue was said to afflict those who spoke against the Church, a view that the Church, not always strictly scientific in interpretation of phenomena, did not discourage.

Here is a translation which Sir D'Arcy Power has made from Paul de

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Sorbant, a German physician writing in 1672, in his *Universæ Medicina*. "We saw"; he says, "an ulcer of the tongue degenerating into cancer in the noble baron Vertemali, which caused such a haemorrhage from destruction of the sublingual arteries and veins that the patient was suffocated. He recognised with great penitence that the cause of this cancer was a divine punishment because he had often abused the clergy." Benetus, about the same time, in his book called *Medicinae Septentriniolanus Collatitia*, describes a case of what he calls "Tumor Linguae Miraculosa." Here is a translation of part of it. "There was lately a certain baron who had a very poisonous tongue. He not only directed his jibes against all and sundry, but he kept his most venomous shafts for the clergy and those who devoted themselves to God's service. He was caught at last in the very act, by a holy brother of good repute as he was peeling this cursed bell, who said to him :

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Your foul tongue has overlong deserved that punishment from an offended God which it will shortly receive.' The Baron went off undismayed, but a few days afterwards a small swelling began to grow on the side of his tongue. Little by little it increased in size until it became an inoperable cancer, and at length the tongue having become incurved, twisted and drawn back to his throat, miserably afflicted, but penitent and confessed, he was summoned before the Great Judge who calls his servants to a most strict account."

This may all seem very far away and out of contact with our present-day thought, but only two years ago a dear old lady sent to the Cancer Hospital Research Department two pages of closely written typescript, the gist of which was that she was withdrawing her usual annual subscription, as, after giving the matter a great deal of thought, she had come to the conclusion that cancer was caused

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by the consumption of alcohol. So she proposed to forward her usual subscription to the local Temperance Society which really was striking at the root of the problem ! The Secretary wrote and pointed out that cancer is very common in cats who are strict prohibitionists ! The old lady did not reply !

Let us come back again from theory to fact, and consider some of the factors which we know constantly to be associated with cancer, and which we are justified in regarding as being, in many cases, more than predisposing causes.

The most important of these is chronic irritation. We find that almost every cancer is preceded for a longer or shorter period by what may be called a precancerous condition. The more our knowledge increases the more we are finding out that this holds good.

The commonest sites for cancer are the womb, the breast, and the stomach. These together account for more than

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sixty per cent. of all cancers, and far below them in frequency we find the tongue, the lip, and the bowel, and the various glands.

Cancer of the womb is constantly preceded for many years by disease, palpable and curable, often the result of childbearing, and the part where it occurs is one bathed in an acid medium.

Cancer of the breast also is constantly associated with preceding chronic inflammation, this condition itself producing, as one of its by-products, a highly acid substance, further to irritate the delicate cells already near the end of their tether. Mechanical irritation, beyond a doubt, is an important factor. Although in civilised countries the disease is distressingly common, in those countries where the breasts are habitually uncovered, cancer of this organ is extremely rare. The habitual friction of modern clothes predisposes cell-growth, infection from no matter what source is given a foothold, and after years of abuse, the cells lose the

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impulse to normal reaction and at last turn and slay their victim.

There is evidence that about two-thirds of all the cases of cancer of the stomach originate in an old gastric ulcer, and the constant eating of hot food is perhaps enough to account for the remaining third. The delicate gastric cells, more abused than any other cells in the body, are bathed in a highly acid medium. It is no wonder that departure from their appointed path accounts for thirty per cent. of all cancers in men, and in women as well, if we except the two conditions just mentioned.

In cancer of the kidney, the bladder, and the gall bladder, stones are nearly always present to initiate the irritation.

In cancer of the tongue, syphilitic or other preceding conditions are nearly always there, whether it be the irritation from raw alcohol, hot tobacco smoke, or a broken tooth. It is interesting to note that, until syphilis appeared in Europe, cancer of the

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tongue was practically unrecorded in the existing literature. We have no need to go any further for examples of these precancerous irritative conditions. They are all curable or removable. but, as they do not as a rule give rise to acute painful symptoms, severely inconveniencing the patient, they are difficult to treat, and the unfortunate patient is told to *wait and see*, and is given medicine which may for a while relieve, but which—alas!—seldom has a chance to cure, or to prevent the fate which is slowly overtaking him.

So far the evidence which has been brought before you, that chronic irritation has a causal connection with cancer, has been of a circumstantial nature : it has often enough been found in what we may call suspicious circumstances, but that does not prove that by itself it can directly cause the disease. If a man is seen hanging about the place where a burglary has been committed, it does not prove that he participated in it. He may be a burglar, or he may

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be what lawyers call an accessory before the fact, and before we can feel reasonably sure that he is a guilty party we must, unless we can actually see him committing the crime, find that whenever he is present, and he has a chance, a burglary takes place.

Now in scientific investigation we can do what in ordinary life is not possible; we can take our burglar, arrange a set of suitable circumstances and see what happens and with what degree of regularity thefts occur. In the last four or five years something like this has been done on a large scale with cancer, and a large body of evidence is accumulating which suggests that, given suitable circumstances, chronic irritation will produce cancer with a fair degree of regularity, at least in some places. If it will do so in some places there is no reason to doubt that, under circumstances which for the moment we do not quite understand, it will do so in all the places where cancer is found.

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That this is so has not yet been completely proved, but I think there is a good deal of evidence along this line. It has been known for a great number of years that certain skin cancers are constantly found in people whose occupations necessitate their skin being in contact with certain chemical irritants. For instance, the workers in shale oil are often afflicted with cancer of the skin. In the spinning industry, when reaching over to deal with the machinery, a place on the worker's leg is always rubbing up against an oily spindle. This process goes on for years at the same spot, and these people are found frequently to get cancer, beginning at the irritated place. Some aniline dyes are excreted in the urine, and growths of the bladder are very frequent in aniline workers. In India, some native tribes carry little metal boxes containing charcoal next to their skin in order to warm themselves, and the warmed spot frequently becomes the seat of a malignant ulcer.

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Further, in chimney-sweeps, whose is always more or less impregnated with carbon, we find that cancer frequently develops in those places where the soot is difficult to wash completely away and often is not cleaned off for years at a time. Finally, we have the well-known examples of skin cancer among X-ray workers, and mouth-cancer in those who chew betel nut.

Now it is just this type of cancer that we have the opportunity to imitate in the laboratory. Dr Leitch, of the Cancer Hospital, has taken rats, guinea-pigs and rabbits; and, day after day for months, soot, tar, oils and all the irritants he could think of were respectively painted on some selected part of their bodies. At the Cancer Hospital he started using tar to paint on the under surface of the bodies of white mice. This was done every morning for several months, and, in a large percentage of cases, small warts were produced. The fate of these warts varied; some of them dis-

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appeared, but others progressed to the formation of true cancer. The results of these experiments made it extremely probable that the irritants were the direct cause of the cancer. Of course it is not *proved*, for it is possible to assume that there is some ubiquitous "other cause", only waiting till the tissue resistance is lowered enough by the irritants to get its chance to act. Another interesting fact, which transpired as the result of this work, is that some of the animals from whom the warts disappeared developed cancer a month or so subsequent to the disappearance, thus showing that the *predisposition* to cancer formation is acquired long before the growth actually appears.

In human beings, the process of cancer formation in response to chemical irritants takes much longer (often twenty to thirty years), and is preceded by much the same sort of preliminary skin reaction as in animals.

In looking for a proximal cause for

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cancer production, we should not, I think, look for a common cause in all cases, but should try to find something or *anything* which will produce the necessary previous irritation.

It has not, I think, been established beyond a doubt that chronic irritation is the *sole* exciting cause of cancer—this in the nature of things would be very difficult to prove—but it has been shewn that its presence strongly predisposes to new growth formation.

The problem which now arises is that of how we are going to put this knowledge we have gained to practical use in the prevention of cancer. In order to solve this we will consider in some detail the three commonest cancers met with, namely cancer of the breast, the womb and the stomach, and we will see how the problem applies to them.

Now in cancer of the breast we have this outstanding fact that, almost all the cases show for some years beforehand obvious signs of chronic inflammation of the breast, and in

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all of them this precancerous stage can be seen, when they are examined microscopically.

Obviously this is the time to deal with the disease ; and the way to do so is systematically to examine microscopically (by a procedure in itself devoid of all risk, except the very small one due to the administration of a general anaesthetic), every *doubtfully* malignant breast, afflicted by chronic inflammation. This may seem a revolutionary thing to say ; but if we set ourselves to deal with this plague in the logical manner that we employ when we sit down to deal with any other pest, and, if we follow all the facts known to their inevitable conclusion, we are driven to it, and we shall see that there is no other course open to us but to *deal in a wholesale manner with the precancerous condition*. To do this we shall have to undertake a long campaign of education. One of the leading authorities on breast cancer in America, did undertake such a campaign in his

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own district, with the result that, from the enthusiastic propaganda of one man, the proportion of precancerous to fully developed malignant lesions which appeared at his clinic rose in six years by thirteen per cent. In twenty years the proportion of fully developed cancer to pre-malignant lesions dropped from ninety to seventy-eight per cent.

I am quite sure of the fact that the adoption of this proposal would mean operations upon a number of breasts which would never become cancerous, but, so far as I can see, we cannot help this, any more than we can help vaccinating a large number of people who will never have small-pox, or, when we isolate diphtheria contacts, can we help disturbing also a large number of people who will never get diphtheria. The public have been educated to regard these precautions as natural and proper, and as a rule raise no objections to their being carried out. Dr Bloodgood, to whose educa-

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tional work I have just referred, states that if any woman could be kept under sufficiently close observation, she could be practically assured against death from cancer. I think every other surgeon of experience would agree with him.

So much for prevention and the precancerous lesions. Let us come to the question of the cure. Here we find that the chances of cure in any particular case simply depend on the stage at which the case appears for treatment. We can for convenience divide cases into two groups ; those which have glands involved and those which have not. By this I mean those which have glands so grossly involved that they are appreciable to the touch. Again quoting Dr Bloodgood, it is found that of those cases with gland involvement, twenty-three per cent. only are cured after seven years but, of those without gland involvement, sixty-five per cent.

Now, here is the fact which ought to
us to action : the average dura-

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tion of the disease in these cured cases was nine months—*nine precious months* in which that remaining thirty, or forty, per cent. might have been cured *if they had only been treated earlier*. Or, ~~if~~ they had been properly examined still earlier by a trained person, the disease could have been dealt with earlier with a still better chance of ultimate cure, and it is Dr C. H. Mayo who has said that there is no reason on earth why about ninety-five per cent. of all cases of cancer of the breast cannot be permanently cured.

So far we have spoken in detail of cancer of the breast but, when we come to deal with cancer of the uterus, we shall find that the facts are almost exactly analogous, only that the results of indecision and delay are even more deplorable. We find that, by the time they come for treatment, about half the cases are quite incurable, and those which are operable are as a rule a great deal further advanced than those of cancer of the breast. In spite of this

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we find that out of two hundred consecutive cases no less than forty per cent. were cured; that is to say, had no recurrence within seven years. All the cases which were operated on had had quite definite symptoms for six months. In other words, the patient herself should have come for examination six months before she did, and if she had been examined in the course of a proper routine, the disease could have been discovered far earlier than was the case.

Quite recently, a report of a series of cases has been published by Professor Faure, a distinguished French gynæcologist, which so exactly illustrates my views that perhaps I may be forgiven for making use of it. Faure cut ninety-six cases of cancer of the uterus and has divided them into good cases, mediocre cases and bad cases. It is significant that there were only twenty-one "good" cases, thirty-five "mediocre" cases and forty "bad" cases. The good cases are what I have called early cases,

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the mediocre cases correspond to moderately advanced cancer, and the bad cases to those which are on the border line between operability and non-operability. His total results approximate very nearly to most other published lists but their analysis is very significant. Of the good cases there was one operative death; of the remainder seventy-five per cent. were cured and twenty-five per cent. recurred.

Of the mediocre cases there was an operative mortality of 8.57%. Of those surviving the operation 62.5% were cured and 37.5% recurred. In the bad cases there was a post-operative mortality of 22.5%: only six were cured and twenty-five recurred. That is to say, respectively, 19.35% were cured and 80.65% recurred. These figures tell their own tale.

With this hopeless condition of affairs it is no use saying that the results of surgery are bad. They are; but it is not the fault of doctors, or the methods at their disposal; it is the misfortune

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of the patient that her lack of proper education must bear the blame.

Cancer of the uterus is in many cases preceded by precancerous lesions, all amenable to various kinds of treatment. Again, the only way to deal with it is not to wait and see whether a woman has got cancer but to look and see that she has not. Until this is our attitude, the results are not likely to be much better, whatever the means at our disposal for its cure.

Finally, turning to another great group of cancers which make up thirty per cent. of all in men (and in women too, if we exclude the two previously mentioned types), we find exactly the same condition of affairs.

In two out of every three cases of cancer of the stomach there is evidence that it has arisen in an old ulcer, and Dr Mayo has suggested that eating hot food may account for the remaining third. It is moreover the experience of all surgeons who systematically submit all gastric ulcers upon which they

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operate to microscopic examination, that about twenty per cent. of them all are malignant.

We have before us the plain fact that from ten to twenty per cent. of all chronic ulcers which have come for surgical treatment are already malignant and can only be cured by a complete removal. Another fact also requires taking into the most serious consideration, and this is, that it is the considered opinion of by far the large majority of experienced surgeons that exploration and some form of operation is the best treatment for every case of chronic gastric ulcer which has recurred once, or at least twice, after a thorough course of medical treatment. (The term "chronic gastric ulcer" is here used in its strictest scientific sense, and by it is meant an ulcer whose diameter in any one direction is more than a centimeter, and whose edges are hard and thickened). In spite of this, a distinguished surgeon recently put on record that every case of gastric ulcer

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upon which he operated had on an average been "cured" nine times. Why is this? The reason is clear. In nearly every case the symptoms of gastric ulcer (and, remember! twenty per cent. are already cancerous) can be relieved for a time by palliative treatment, when once again the deluded patient thinks he is cured.

There is no need for me to point the lesson from this. I have put forward the facts, and every one can draw his own conclusions. There is only one gleam of hope that I can see on the horizon, and that is, in dealing with the disease in an early stage by radical measures, and, in twenty per cent. of the cases, thus combining prevention with cure.

Again, we must alter our attitude. We must look and see, not merely "dope" and see! Once symptoms of this disease have recurred after efficient treatment, there is only one good reason for not looking and making certain, and that is when the risks of

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looking exceed those of the lesion being malignant—that is to say, somewhere between ten and twenty per cent. At present, the risks of looking are about one in a thousand, and the risks of removal of a cancer about three per cent., taking all cases, most of which are at an advanced stage. The operative risks of earlier cases are less than this, and to this must be added about a two per cent. risk of a further operation being necessary—in all, not exceeding five per cent.

I realise that the adoption of this policy will mean a certain number of otherwise avoidable operations. I know that it will mean operating on a few cases that would otherwise get better by themselves, or by other means. But until it is adopted, there is, as far as I can see, no prospect of reducing the death-rate from cancer of the stomach. For so long as indiscriminate medicine-taking has precedence over exact methods of investigation and treatment, so long will cancer of the

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stomach continue to make up thirty per cent. of all cancers. Again the question is largely out of the hands of the doctors. As long as patients come to a doctor wanting "a bottle of medicine, doctor, just to help me carry on", so long will they get it, as the doctor finds it hard to refuse. For he knows the patient will go from doctor to doctor till he gets what he wants.

I have dealt in some detail with the three commonest types of cancer, but the same arguments apply to all. The problem is not so much how to cure cancer—so much can, and is being constantly done by one method or another—but how to educate people so that we can get hold of cancer early. The problem is one of diagnosis, and is therefore to be solved by education and courage, not by hesitation and fear.

No statement of the cancer problem would be complete without some mention of two methods of treatment which have recently come much to the fore : namely, the use of X-rays and of radium.

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To give any really useful account of these is very difficult, as no really satisfactory groups of cases have been published, and one can only speak from one's own experience and that of colleagues who have been working with them.

The action of both these methods of treatment is in essence the same. It has been found that X-rays and radium, have the power of destroying living tissue when such is exposed to their action for varying lengths of time. Fortunately, cancerous tissue is destroyed before normal healthy tissue, and it is the aim of the treatment to expose the growth to that dosage of rays which will kill the malignant tissue but just fall short of doing harm to the normal tissue. Sometimes this is more easily done with X-rays and sometimes with radium ; it all depends on the position of the growth. This all sounds very attractive, and one would think that, on the surface of things, with such a weapon at our

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disposal, every case could easily be efficiently dealt with. But, like many other superficially attractive things, it was found on further examination to have its drawbacks. Although a proper dose of X-rays will kill cancer tissue, a smaller dose will stimulate it to further action. Further, these rays have, comparatively speaking, a very low penetrating power. They are absorbed and rendered inactive by thin layers of metal, of skin or of other tissue.

Now, as has already been explained, a malignant growth, as well as extending superficially, tends to spread very deeply and also to involve neighbouring structures, and when X-rays or radium are applied to it, we find that in some cases it will deal with the more superficial parts of the growth but leave the deeper parts untouched, or even more active than before. All kinds of methods have been tried to get over this, such as burying radium in the substance of the growth, and using very big doses, applied to various aspects

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of the growth, but, so far, although there have been some very encouraging results, the problem has not been solved.

As has been said, it is extremely difficult to estimate the exact value of this treatment, as no figures are of any value till *seven years* at least have elapsed after treatment, and no such figures have been published. There can be no doubt, however, that an occasional case has been cured, but it is the experience of all that the results of radium treatment do not approximate in any way to the percentage of cures obtained by surgery, even in those types of cancer which react best to X-rays or radium.

Dr Knox, of the Cancer Hospital, London, who has had much experience of high tension X-rays, says that the treatment of malignant disease by X-rays has not yet reached that stage where it ought to be given to any operable case instead of an operation. I think this opinion may be reg

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an authoritative statement of the situation as it is at present.

This is not all, however ; X-rays and radium have a very important place in the treatment of cancer, and as far as we can see at present, the future hope lies in a judicious combination of one or the other of these with surgery, for early operable cases, and their prolonged and intensive use in those advanced cases which cannot be removed by other means. A few advanced cases have even been rendered operable by this means.

In combination with surgery this method has its very greatest use in the prevention of superficial recurrences. In every operation, in spite of the greatest care, it is impossible to avoid the setting free into the tissues of a few cancer cells which may grow later into a recurrence. Post-operative radiation bids fair to abolish this type of recurrence, which formerly accounted for a good percentage of all recurrences.

From time to time many methods

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have been brought forward which have for a little while promised well, but so far none of them has produced results in any way comparable with those obtained by complete removal of the growth by surgical means.

I have not dealt with these in any detail here because, whether ultimately we use drugs, surgery, violet leaves or any of the recently popularised methods of "taking thought" to cure the disease, the main point of my thesis will still hold good, and that is, that by far the most important factor in the cure of the disease is that of *early diagnosis*. This lies in the hands of the public far more than in those of the medical profession. If the public want early diagnosis they will get it, when they insist on it, just as they get anything else they insist on, from self-government to prohibition, no matter how good or bad it may be for them.

Briefly stated, most cases of early cancer are curable, and the diagnosis of early cancer is only to be made by

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looking instead of *waiting*. On these facts, certain constructive proposals can be based. They are so simple that they are not likely to be heeded for some time to come, for the public has always preferred Abana and Pharpar, rivers of Damascus, to washing in Jordan, and I suppose always will do, till we reach a more enlightened age.

Nevertheless I believe it is true, and without exaggeration, to say that about ninety per cent. of all cases could be cured or prevented if the following statements were accepted.

If all persons over forty years of age were routinely examined once every six months to see that they had not cancer, or a precancerous condition, and if these when found were promptly dealt with, then cancers of the rectum, tongue, lip, breast, skin and uterus would cease to be the plagues they are at present.

Similarly, if every patient who had taken more than a pound of bismuth to relieve gastric pain were routinely

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explored to see that cancer or gastric ulcer did not exist, the large majority of growths in this region would be either prevented or cured. Similar rules can easily be devised to deal with cancers arising in other parts. What is wanted is a change of attitude on the part of everyone concerned. After all, a fortnight in bed, with forty-eight hours of discomfort, is not too great a price to pay for freedom from this disease, and, with proper examination, even this would be unnecessary in most cases.

Every intelligent person is aware that, in order to ensure freedom from dental disease, it is necessary to have his teeth examined every six months, and to have small lesions dealt with in their very early stages. All have come to this conclusion because they know that neglected dental disease means pain; and they now look to see that their teeth are normal, instead of waiting for a toothache to come. It is true that there are still some of our weaker brethren who still wait till they

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at toothache before they visit the dentist ; and for them there is nothing to be done. In the same way, if we wait for the advanced signs of cancer to develop, the position with regard to its cure will remain approximately what it is to-day.

The education of the public up to this pitch is by no means an impracticable proposal. The position with regard to appendicitis is very much the same as that of cancer. What has been done in the case of appendicitis ? The mortality is in proportion to the number of hours during which the disease has existed. Twenty years ago appendicitis was responsible for a large number of deaths. During 1919 and 1920 there was, in a large London General Hospital, only one death from appendicitis, and yet there were at least 5 cases dealt with every week. This improvement is entirely the result of education of the public and their doctors. They know that to be cured operation must be early, and so we no

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longer wait to see whether the patient is going to die ; if we suspect it, we look and see whether it is present or not. True, we remove unnecessarily fair number of appendixes but, by so doing, we purchase, for a much larger number of people, immunity from death by this disease. When exactly the same principle is applied to cancer we shall be in a position to be a great deal more satisfied than we are at present.

One of the most successful ways of treating a patient with fixed ideas is by the use of *explanation* combined with strong *counter-suggestion*. This is the method of psycho-analysis and hypnotism. No patient is more susceptible to this kind of treatment than that capricious lady, Public Opinion. If we want to realise the ideals put forward in the early part of this essay, we must mobilise all our resources : the Press ; the Platform ; the Consulting Room : for a prolonged and intensive campaign against this black spot on our civilization.

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